

01/18/00
jc511 U.S. PRO
09/484418
01/18/00

EVENSON, McKEOWN, EDWARDS & LENAHAN, P.L.L.C.
1200 G Street, N.W., Suite 700
Washington, D.C. 20005
(202) 628-8800

January 18, 2000

jc511 U.S. PRO
09/484418
01/18/00

Box PATENT APPLICATION

Assistant Commissioner for Patents Re: New U.S. Patent Appln.
Washington, D.C. 20231 Our Ref: 951/48439

Sir:

Transmitted herewith for filing is the patent application of:

Ruediger BARTZ

entitled: **METHOD FOR AUTHENTICATING A SPARE KEY FOR USING A VEHICLE**

Enclosed are:

1. Specification, including 16 claims (12 pages).
2. 1 Sheet of X Formal Informal drawings showing a sole figure.
3. X Declaration and Power of Attorney (**unexecuted**).
4. Priority is being claimed under 35 U.S.C. §119 and 37 C.F.R. §1.55 based on Priority Document 199 01 277.6, filed in Germany on January 15, 1999.
5. The filing fee has been calculated as shown below:

Basic Fee				
Total Claims	<u>16</u>	- 20	= <u>0</u>	x \$ 9/18 = \$
Independent Claims	<u>1</u>	- 3	= <u>0</u>	x \$39/78 = \$
Multiple Dependent Claim Presented				\$130/260 = \$
Total Filing Fee				<u>\$690.00</u>

The filing fee is being deferred.

Respectfully submitted,


Jeffrey D. Sanok
Reg. No. 32,169

JDS:ps

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

SPECIFICATION

INVENTION: **METHOD FOR AUTHENTICATING A SPARE KEY
FOR USING A VEHICLE**

INVENTOR: **Ruediger BARTZ**

Citizenship: German

Post Office Address/
Connollystr. 15 K

D-80809 Muenchen

Residence: Germany

ATTORNEYS: **EVENSON, McKEOWN, EDWARDS & LENAHAN, P.L.L.C.**

Suite 700

1200 G Street, N.W.

Washington, D.C. 20005

Telephone No.: (202) 628-8800

Facsimile No.: (202) 628-8844

METHOD FOR AUTHENTICATING A SPARE KEY FOR USING A VEHICLE

BACKGROUND AND SUMMARY OF THE INVENTION

This application claims the priority of German Application No. 199 01 277.6, filed January 15, 1999, the disclosure of which 5 is expressly incorporated by reference herein.

The invention relates to a method for authenticating a spare vehicle key for use with a vehicle.

A method of this type is known from European Patent document EP 0 788 946 A. In this reference, with the aid of a separate programming unit located outside the vehicle, data specific to a part of the vehicle are retrieved from a central station, transmitted from the central station to the programming unit, and transferred from the latter to the vehicle. The data are then decoded in the vehicle. Although double coding is used some of the time, problems may arise with the known method if the 15 separate programming unit is misused.

Overall, it should be noted that the general trend to increase protection against theft and break-ins runs counter to the customer service requirement of being able to open and move 20 a vehicle when the original key is not present, for example if the original key has been lost or inadvertently locked inside the

vehicle. The problem becomes even more acute when burglar-proof glass is used.

5

The goal of the invention is therefore to create a method of the type referred to above that is easy to perform and use, as well as being protected against misuse.

10
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
420
430
440
450
460
470
480
490
500
510
520
530
540
550
560
570
580
590
600
610
620
630
640
650
660
670
680
690
700
710
720
730
740
750
760
770
780
790
800
810
820
830
840
850
860
870
880
890
900
910
920
930
940
950
960
970
980
990
1000
1010
1020
1030
1040
1050
1060
1070
1080
1090
1100
1110
1120
1130
1140
1150
1160
1170
1180
1190
1200
1210
1220
1230
1240
1250
1260
1270
1280
1290
1300
1310
1320
1330
1340
1350
1360
1370
1380
1390
1400
1410
1420
1430
1440
1450
1460
1470
1480
1490
1500
1510
1520
1530
1540
1550
1560
1570
1580
1590
1600
1610
1620
1630
1640
1650
1660
1670
1680
1690
1700
1710
1720
1730
1740
1750
1760
1770
1780
1790
1800
1810
1820
1830
1840
1850
1860
1870
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
2120
2130
2140
2150
2160
2170
2180
2190
2200
2210
2220
2230
2240
2250
2260
2270
2280
2290
2300
2310
2320
2330
2340
2350
2360
2370
2380
2390
2400
2410
2420
2430
2440
2450
2460
2470
2480
2490
2500
2510
2520
2530
2540
2550
2560
2570
2580
2590
2600
2610
2620
2630
2640
2650
2660
2670
2680
2690
2700
2710
2720
2730
2740
2750
2760
2770
2780
2790
2800
2810
2820
2830
2840
2850
2860
2870
2880
2890
2900
2910
2920
2930
2940
2950
2960
2970
2980
2990
3000
3010
3020
3030
3040
3050
3060
3070
3080
3090
3100
3110
3120
3130
3140
3150
3160
3170
3180
3190
3200
3210
3220
3230
3240
3250
3260
3270
3280
3290
3300
3310
3320
3330
3340
3350
3360
3370
3380
3390
3400
3410
3420
3430
3440
3450
3460
3470
3480
3490
3500
3510
3520
3530
3540
3550
3560
3570
3580
3590
3600
3610
3620
3630
3640
3650
3660
3670
3680
3690
3700
3710
3720
3730
3740
3750
3760
3770
3780
3790
3800
3810
3820
3830
3840
3850
3860
3870
3880
3890
3900
3910
3920
3930
3940
3950
3960
3970
3980
3990
4000
4010
4020
4030
4040
4050
4060
4070
4080
4090
4010
4020
4030
4040
4050
4060
4070
4080
4090
4100
4110
4120
4130
4140
4150
4160
4170
4180
4190
4200
4210
4220
4230
4240
4250
4260
4270
4280
4290
4300
4310
4320
4330
4340
4350
4360
4370
4380
4390
4400
4410
4420
4430
4440
4450
4460
4470
4480
4490
4500
4510
4520
4530
4540
4550
4560
4570
4580
4590
4600
4610
4620
4630
4640
4650
4660
4670
4680
4690
4700
4710
4720
4730
4740
4750
4760
4770
4780
4790
4800
4810
4820
4830
4840
4850
4860
4870
4880
4890
4900
4910
4920
4930
4940
4950
4960
4970
4980
4990
5000
5010
5020
5030
5040
5050
5060
5070
5080
5090
5010
5020
5030
5040
5050
5060
5070
5080
5090
5100
5110
5120
5130
5140
5150
5160
5170
5180
5190
5200
5210
5220
5230
5240
5250
5260
5270
5280
5290
5300
5310
5320
5330
5340
5350
5360
5370
5380
5390
5400
5410
5420
5430
5440
5450
5460
5470
5480
5490
5500
5510
5520
5530
5540
5550
5560
5570
5580
5590
5600
5610
5620
5630
5640
5650
5660
5670
5680
5690
5700
5710
5720
5730
5740
5750
5760
5770
5780
5790
5800
5810
5820
5830
5840
5850
5860
5870
5880
5890
5900
5910
5920
5930
5940
5950
5960
5970
5980
5990
6000
6010
6020
6030
6040
6050
6060
6070
6080
6090
6010
6020
6030
6040
6050
6060
6070
6080
6090
6100
6110
6120
6130
6140
6150
6160
6170
6180
6190
6200
6210
6220
6230
6240
6250
6260
6270
6280
6290
6300
6310
6320
6330
6340
6350
6360
6370
6380
6390
6400
6410
6420
6430
6440
6450
6460
6470
6480
6490
6500
6510
6520
6530
6540
6550
6560
6570
6580
6590
6600
6610
6620
6630
6640
6650
6660
6670
6680
6690
6700
6710
6720
6730
6740
6750
6760
6770
6780
6790
6800
6810
6820
6830
6840
6850
6860
6870
6880
6890
6900
6910
6920
6930
6940
6950
6960
6970
6980
6990
7000
7010
7020
7030
7040
7050
7060
7070
7080
7090
7010
7020
7030
7040
7050
7060
7070
7080
7090
7100
7110
7120
7130
7140
7150
7160
7170
7180
7190
7200
7210
7220
7230
7240
7250
7260
7270
7280
7290
7300
7310
7320
7330
7340
7350
7360
7370
7380
7390
7400
7410
7420
7430
7440
7450
7460
7470
7480
7490
7500
7510
7520
7530
7540
7550
7560
7570
7580
7590
7600
7610
7620
7630
7640
7650
7660
7670
7680
7690
7700
7710
7720
7730
7740
7750
7760
7770
7780
7790
7800
7810
7820
7830
7840
7850
7860
7870
7880
7890
7900
7910
7920
7930
7940
7950
7960
7970
7980
7990
8000
8010
8020
8030
8040
8050
8060
8070
8080
8090
8010
8020
8030
8040
8050
8060
8070
8080
8090
8100
8110
8120
8130
8140
8150
8160
8170
8180
8190
8200
8210
8220
8230
8240
8250
8260
8270
8280
8290
8300
8310
8320
8330
8340
8350
8360
8370
8380
8390
8400
8410
8420
8430
8440
8450
8460
8470
8480
8490
8500
8510
8520
8530
8540
8550
8560
8570
8580
8590
8600
8610
8620
8630
8640
8650
8660
8670
8680
8690
8700
8710
8720
8730
8740
8750
8760
8770
8780
8790
8800
8810
8820
8830
8840
8850
8860
8870
8880
8890
8900
8910
8920
8930
8940
8950
8960
8970
8980
8990
9000
9010
9020
9030
9040
9050
9060
9070
9080
9090
9100
9110
9120
9130
9140
9150
9160
9170
9180
9190
9200
9210
9220
9230
9240
9250
9260
9270
9280
9290
9300
9310
9320
9330
9340
9350
9360
9370
9380
9390
9400
9410
9420
9430
9440
9450
9460
9470
9480
9490
9500
9510
9520
9530
9540
9550
9560
9570
9580
9590
9600
9610
9620
9630
9640
9650
9660
9670
9680
9690
9700
9710
9720
9730
9740
9750
9760
9770
9780
9790
9800
9810
9820
9830
9840
9850
9860
9870
9880
9890
9900
9910
9920
9930
9940
9950
9960
9970
9980
9990
10000
10010
10020
10030
10040
10050
10060
10070
10080
10090
10010
10020
10030
10040
10050
10060
10070
10080
10090
10100
10110
10120
10130
10140
10150
10160
10170
10180
10190
10200
10210
10220
10230
10240
10250
10260
10270
10280
10290
10300
10310
10320
10330
10340
10350
10360
10370
10380
10390
10400
10410
10420
10430
10440
10450
10460
10470
10480
10490
10500
10510
10520
10530
10540
10550
10560
10570
10580
10590
10600
10610
10620
10630
10640
10650
10660
10670
10680
10690
10700
10710
10720
10730
10740
10750
10760
10770
10780
10790
10800
10810
10820
10830
10840
10850
10860
10870
10880
10890
10900
10910
10920
10930
10940
10950
10960
10970
10980
10990
11000
11010
11020
11030
11040
11050
11060
11070
11080
11090
11100
11110
11120
11130
11140
11150
11160
11170
11180
11190
11200
11210
11220
11230
11240
11250
11260
11270
11280
11290
11300
11310
11320
11330
11340
11350
11360
11370
11380
11390
11400
11410
11420
11430
11440
11450
11460
11470
11480
11490
11500
11510
11520
11530
11540
11550
11560
11570
11580
11590
11600
11610
11620
11630
11640
11650
11660
11670
11680
11690
11700
11710
11720
11730
11740
11750
11760
11770
11780
11790
11800
11810
11820
11830
11840
11850
11860
11870
11880
11890
11900
11910
11920
11930
11940
11950
11960
11970
11980
11990
12000
12010
12020
12030
12040
12050
12060
12070
12080
12090
12100
12110
12120
12130
12140
12150
12160
12170
12180
12190
12200
12210
12220
12230
12240
12250
12260
12270
12280
12290
12300
12310
12320
12330
12340
12350
12360
12370
12380
12390
12400
12410
12420
12430
12440
12450
12460
12470
12480
12490
12500
12510
12520
12530
12540
12550
12560
12570
12580
12590
12600
12610
12620
12630
12640
12650
12660
12670
12680
12690
12700
12710
12720
12730
12740
12750
12760
12770
12780
12790
12800
12810
12820
12830
12840
12850
12860
12870
12880
12890
12900
12910
12920
12930
12940
12950
12960
12970
12980
12990
13000
13010
13020
13030
13040
13050
13060
13070
13080
13090
13100
13110
13120
13130
13140
13150
13160
13170
13180
13190
13200
13210
13220
13230
13240
13250
13260
13270
13280
13290
13300
13310
13320
13330
13340
13350
13360
13370
13380
13390
13400
13410
13420
13430
13440
13450
13460
13470
13480
13490
13500
13510
13520
13530
13540
13550
13560
13570
13580
13590
13600
13610
13620
13630
13640
13650
13660
13670
13680
13690
13700
13710
13720
13730
13740
13750
13760
13770
13780
13790
13800
13810
13820
13830
13840
13850
13860
13870
13880
13890
13900
13910
13920
13930
13940
13950
13960
13970
13980
13990
14000
14010
14020
14030
14040
14050
14060
14070
14080
14090
14100
14110
14120
14130
14140
14150
14160
14170
14180
14190
14200
14210
14220
14230
14240
14250
14260
14270
14280
14290
14300
14310
14320
14330
14340
14350
14360
14370
14380
14390
14400
14410
14420
14430
14440
14450
14460
14470
14480
14490
14500
14510
14520
14530
14540
14550
14560
14570
14580
14590
14600
14610
14620
14630
14640
14650
14660
14670
14680
14690
14700
14710
14720
14730
14740
14750
14760
14770
14780
14790
14800
14810
14820
14830
14840
14850
14860
14870
14880
14890
14900
14910
14920
14930
14940
14950
14960
14970
14980
14990
15000
15010
15020
15030
15040
15050
15060
15070
15080
15090
15100
15110
15120
15130
15140
15150
15160
15170
15180
15190
15200
15210
15220
15230
15240
15250
15260
15270
15280
15290
15300
15310
15320
15330
15340
15350
15360
15370
15380
15390
15400
15410
15420
15430
15440
15450
15460
15470
15480
15490
15500
15510
15520
15530
15540
15550
15560
15570
15580
15590
15600
15610
15620
15630
15640
15650
15660
15670
15680
15690
15700
15710
15720
15730
15740
15750
15760
15770
15780
15790
15800
15810
15820
15830
15840
15850
15860
15870
15880
15890
15900
15910
15920
15930
15940
15950
15960
15970
15980
15990
16000
16010
16020
16030
16040
16050
16060
16070
16080
16090
16100
16110
16120
16130
16140
16150
16160
16170
16180
16190
16200
16210
16220
16230
16240
16250
16260
16270
16280
16290
16300
16310
16320
16330
16340
16350
16360
16370
16380
16390
16400
16410
16420
16430
16440
16450
16460
16470
16480
16490
16500
16510
16520
16530
16540
16550
16560
16570
16580
16590
16600
16610
16620
16630
16640
16650
16660
16670
16680
16690
16700
16710
16720
16730
16740
16750
16760
16770
16780
16790
16800
16810
16820
16830
16840
16850
16860
16870
16880
16890
16900
16910
16920
16930
16940
16950
16960
16970
16980
16990
17000
17010
17020
17030
17040
17050
17060
17070
17080
17090
17100
17110
17120
17130
17140
17150
17160
17170
17180
17190
1

Advantageously, at least some of the data transmissions, such as from the spare key to the central station or from the central station to the vehicle are encoded. In particular, the data transmissions are encoded with a random number. In a particular preferred embodiment, bidirectional data traffic occurs wherein the data transmission takes place in one direction followed by transmission of a confirmation signal in an opposite direction. Further advantageously, the bidirectional data traffic in the one direction takes place based on a public key and the decoding at the central station takes place based on private key.

In a particularly advantageous embodiment, the transmission of the spare key identification number to the central station is performed by the vehicle itself, to which the spare key identification number was previously transmitted.

Also advantageously, data transmission can take place via telephony.

In another advantageous embodiment, before the actual data transmission occurs, a receiver is activated by the spare key.

Other objects, advantages and novel features of the present invention will become apparent from the following detailed

description of the invention when considered in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The single figure is a block diagram showing the operative 5 switchpoints and transmission paths of the method according to the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

The method described here provides the possibility of opening and operating a vehicle 5 with the aid of a universally applicable spare key without impairing the effectiveness of theft protection. When the spare key is authenticated by a central station 6 using the car phone and a central database, a temporary authorization at least to open the vehicle using the spare key is granted.

15 The universally applicable spare key 10 is called a VK key below. Other operating points in the context of the method are the central database 12 (called VK database), a car phone present in the vehicle 14, a base interface telephone 16 (called BIT interface), and a cellular telephone of a customer service 20 representative who brings the spare key into use 18. It is also important to use preferably asynchronous algorithms for telephone calls. This makes it unnecessary to ensure that telephone calls

are not being tapped. An "asynchronous algorithm" is understood to be an encoding method that in one direction operates with a public encoding algorithm (public key) and for decoding operates with a secret encoding algorithm (secret "private" key).

5 The evaluation of the signals arriving at the vehicle is preferably effected by the CAS (car access system) control unit
22 that has a ring memory in which the successful VK key authentications are stored and any attempts at manipulation are stored in an attack memory.

10 The entire process of opening the vehicle with the spare key takes place in five steps, I through V as described below and indicated in the Figure.

15 I) By pressing a command key on the VK key, the spare key generates a random number PIN which is decoded and, together with an individual recognition of the spare key
VK_KEY_ID is transmitted to the vehicle with a non-secret (= public) code. The radio receiver 28 of the vehicle receives this radio-transmitted encoded signal Krypt_f1(VK_KEY_ID, PIN) and the random number PIN and sends
20 it to the CAS 22, where the recognition of the spare key VK-KEY-ID is decoded based on recognition of the random number PIN.

II) The service technician transmits the following data, preferably using his cellular telephone 18, to the VK database 6:

5 random number PIN, and the telephone number and chassis number of the vehicle. With telephone transmission, coding is unnecessary.

Using the chassis number, the VK database 6 finds the corresponding public key of the vehicle (P-CODE-FZG) and uses it to encode the random number PIN.

10 III) The car phone 14 is dialed from the VK database and the encoded random number PIN is transmitted, received by the car phone, and forwarded to the CAS control unit 22. The CAS has a secret decoding algorithm secret key (S-CODE-Vehicle) which enables it to regenerate the random number PIN without actually knowing this PIN. The PIN is then compared with the PIN received in step I.

15 IV) If the two PINs are identical, the CAS 22 generates its own random number RAND. RAND and the recognition VK_KEY-ID of the spare key transmitted thereto in step I are each encoded with a public key P-CODE-VK and transmitted to the VK database 6 via the car phone 14. At the VK database, using the secret key S-CODE-VK, the random number RAND and the VK key identifier VK-KEY-ID are regenerated and checked

to see whether the VK key identifier VK_KEY-ID is assigned to a valid spare key. Separate knowledge of the random number RAND is not necessary for this regeneration.

5) V) If the VK key identifier is valid, the random number RAND in response is encoded with a public key P-CODE-Vehicle and transmitted to the CAS 22 in the vehicle 5. The vehicle is able to regenerate the random number RAND with its secret key S-CODE-Vehicle and compare it with the key in its memory. If the two are identical, this is interpreted as validation of the spare key VK_Key and the commands issued with the VK_Key are executed.

10 It should be understood that the structure and operation of the various components used in the system to perform the method according to the present invention are well known by those of skill in the art. As such, they have not been described in detail here, but rather only the inventive method acts for authenticating the spare vehicle key to be used in the vehicle 15 in the absence of the regular key.

20 The foregoing disclosure has been set forth merely to illustrate the invention and is not intended to be limiting. Since modifications of the disclosed embodiments incorporating the spirit and substance of the invention may occur to persons skilled in the art, the invention should be construed to include

everything within the scope of the appended claims and equivalents thereof.

WHAT IS CLAIMED IS:

1. A method for authenticating a spare vehicle key to be used with a vehicle in the absence of a regular key, the method comprising the acts of:

 providing the spare vehicle key with an identification number;

 transmitting said identification number to a central station;

 checking the transmitted identification number by the central station; and

 authenticating the spare vehicle key and sending an authorization signal from the central station to the vehicle.

2. The method according to Claim 1, wherein at least one data transmission by and between the spare vehicle key, central station and vehicle is encoded.

3. The method according to Claim 2, wherein said data transmission occurs in one direction followed by transmission of a confirmation signal in an opposite direction.

4. The method according to Claim 3, wherein bidirectional data traffic in one direction takes place based on a public key and decoding at the central station takes place based on a private key.

5. The method according to Claim 1, wherein the act of transmitting the identification number of the spare vehicle key to the central station is carried out by the vehicle, said identification number of the spare vehicle key having been previously transmitted to the vehicle.

6. The method according to Claim 2, wherein the act of transmitting the identification number of the spare vehicle key to the central station is carried out by the vehicle, said identification number of the spare vehicle key having been previously transmitted to the vehicle.

7. The method according to Claim 3, wherein the act of transmitting the identification number of the spare vehicle key to the central station is carried out by the vehicle, said identification number of the spare vehicle key having been previously transmitted to the vehicle.

8. The method according to Claim 4, wherein the act of transmitting the identification number of the spare vehicle key to the central station is carried out by the vehicle, said identification number of the spare vehicle key having been previously transmitted to the vehicle.

9. The method according to Claim 1, wherein the transmitting acts are performed using telephony.

10. The method according to Claim 2, wherein the transmitting acts are performed using telephony.

11. The method according to Claim 3, wherein the transmitting acts are performed using telephony.

12. The method according to Claim 4, wherein the transmitting acts are performed using telephony.

13. The method according to Claim 5, wherein the transmitting acts are performed using telephony.

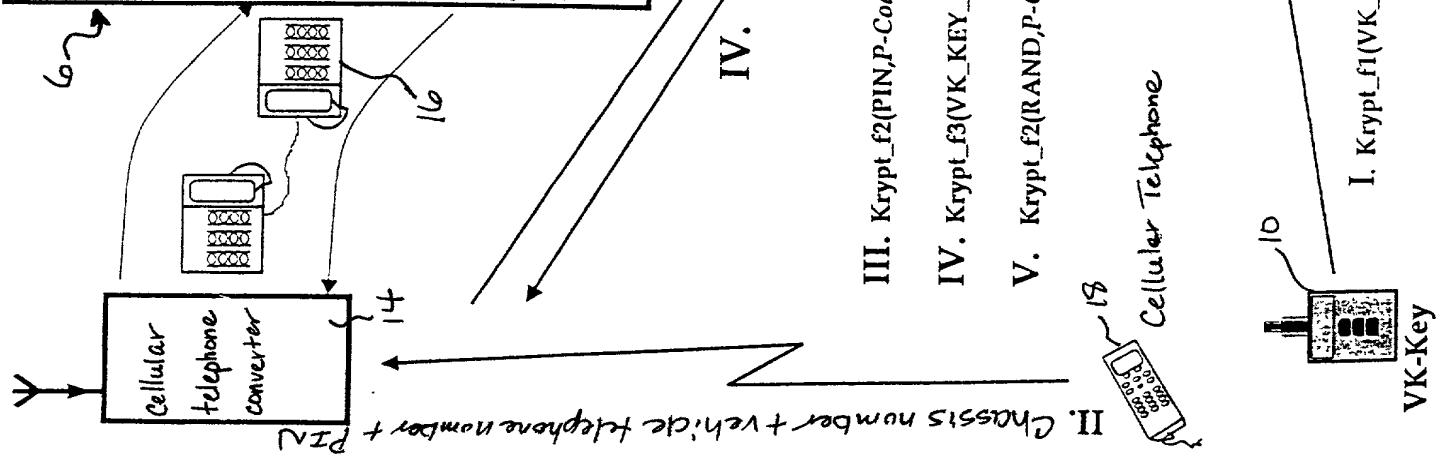
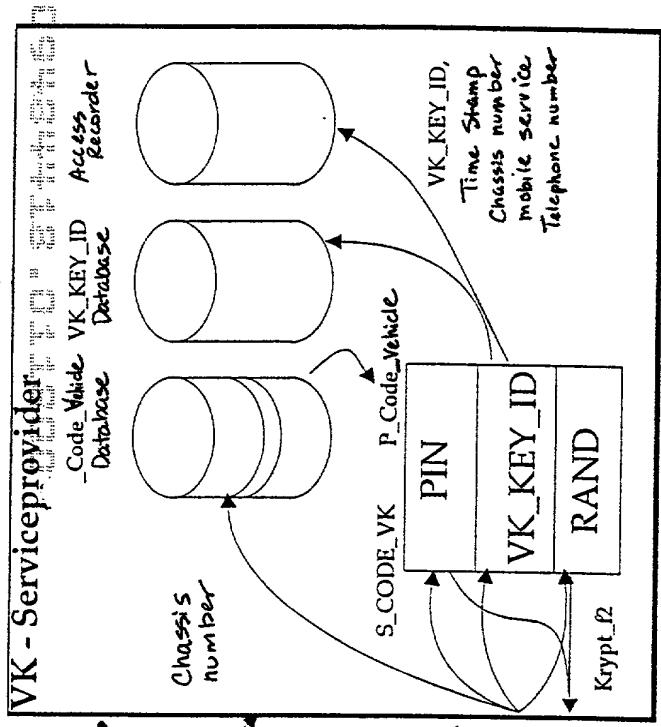
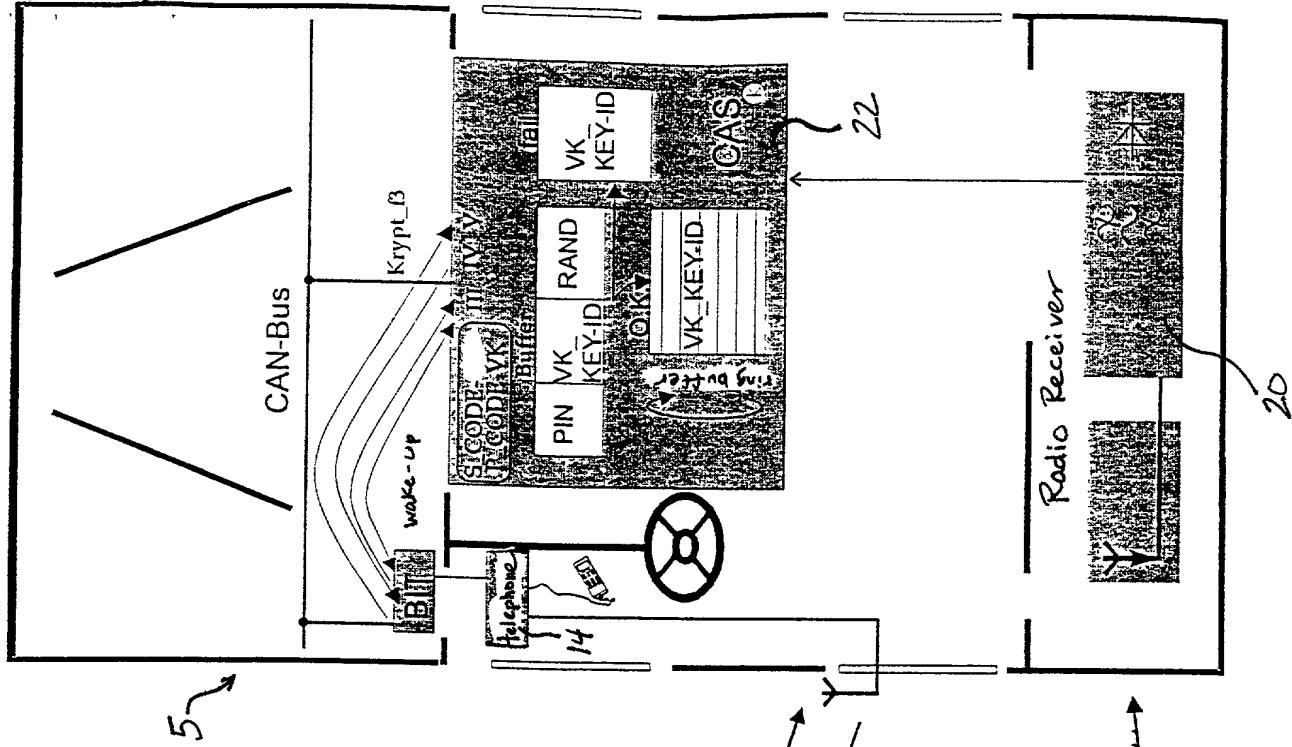
14. The method according to Claim 1, wherein said transmissions are encoded with a random number.

15. The method according to Claim 2, wherein said transmissions are encoded with a random number.

16. The method according to Claim 1, wherein before an actual data transmission, a radio receiver in the vehicle is activated by the spare vehicle key.

ABSTRACT OF THE DISCLOSURE

In a method for authenticating a spare key for use with a vehicle in the absence of the regular key, the spare key is provided with an identification number that is transmitted to, 5 and checked by, a central station. The spare key is authenticated by an authorization signal sent from the central station to the vehicle.



DECLARATION AND POWER OF ATTORNEY - PATENT APPLICATION

As a below named inventor, I hereby declare that my citizenship, postal address and residence are as stated below; that I verily believe I am the original, first and sole inventor (if only one inventor is named below) or a joint inventor (if plural inventors are named below) of the invention entitled:

METHOD FOR AUTHENTICATING A SPARE KEY FOR USING A VEHICLE

the specification of which

X is attached hereto, or

was filed on _____ as Application Serial No. _____ and
was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose all information known to be material to patentability as defined in 37 CFR §1.56. I hereby claim foreign priority benefits under Title 35, United States Code §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed
<u>199 01 277.6</u> (Number)	<u>Germany</u> (Country)	<u>15 January 1999</u> (Day/Month/Year)	<u>Yes</u>
_____ (Number)	_____ (Country)	_____ (Day/Month/Year)	_____

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose all information known to be material to patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status)
--------------------------	---------------	----------

I hereby appoint as principal attorneys Martin Fleit, Reg. No. 16,900; Herbert I. Cantor, Reg. No. 24,392; James F. McKeown, Reg. No. 25,406; Donald D. Evenson, Reg. No. 26,160; Joseph D. Evans, Reg. No. 26,269; Gary R. Edwards, Reg. No. 31,824; Jeffrey D. Sanok, Reg. No. 32,169; and Richard R. Diefendorf, Reg. No. 32,390, to prosecute and transact all business in the Patent and Trademark Office connected with this application and any related United States and international applications. Please direct all communications to:

Evenson, McKeown, Edwards & Lenahan, P.L.L.C.
1200 G Street, N.W., Suite 700
Washington, D.C. 20005
Telephone: (202) 628-8800
Facsimile: (202) 628-8844

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

DECLARATION AND POWER OF ATTORNEY

Attorney Docket No. 951/48439

Page 2

INVENTOR: **Ruediger BARTZ**
Citizenship: German
Post Office Address/ Connollystr. 15 K
D-80809 Muenchen
Residence: Germany

(date)

(signature of 1st inventor)